# LOW TAR/HIGH FLAVOR PROGRAM

## 1990 Operational Plans

**February 13, 1990**

I. **Objective**: To develop ultra-low tar and/or reduced nicotine cigarettes equal subjectively to cigarettes with at least twice the tar and/or nicotine utilizing conventional technology and, as appropriate, technological advances from other programs, particularly those proprietary PM technologies such as ART which may provide a competitive marketing edge for the Company.

II. **Strategies/Timetables**:

A. STRATEGY I -- DEVELOP 2 AND 6 MG CIGARETTES WITH ENHANCED TOTAL SUBJECTIVE CHARACTER.

1. Project 202/235 - Initial emphasis will be toward completion of baseline prototypes, using Blend 218 and paper/CA filters (66% ventilation), with white and cork-on-white tipping, through monadic POL testing. These prototypes will serve as benchmarks for further development of 2mg tar regular and reduced-nicotine cigarettes. Additional filter options are being considered including longer filters and all-paper filters. Additional monadic POL testing of improved 2mg prototypes and appropriate competitive brands will be conducted.

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| POL 0246 | 1st Qtr., 1990 |
| Additional monadic POL testing | 2nd Qtr., 1990 |

2. Project 605 - A monadic POL is planned for a Blend A model using a 2.6 dpf/42000 denier filter and a Winston-type aftercut. In addition to evaluation of several aftercut flavor directions with Blend A, parallel evaluations will be conducted with Blend 218 (Project 202). Additional filter options will continue to be be explored. The best overall prototype will be tested monadically with Marlboro Lights and appropriate competitive brands.

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| POL 0245 | February, 1990 |
| Additional monadic POL testing | 2nd Qtr., 1990 |

3. Project NOVENT - Evaluation of ESP papers will continue, along with various filter options, using Blend A.

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| Final optimized prototype | 2nd Qtr., 1990 |
| External testing | 2nd Qtr., 1990 |

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B. STRATEGY II -- "ULTIMA" -- DEVELOP ULTRALOW TAR (1-3MG) PRODUCTS WHICH WILL PROVIDE A COMPETITIVE EDGE IN THE EXISTING U.L. MARKET SEGMENT.

1. U.L. Segment Assessment - Target brands will be Carlton, Now and Kent III families as well as European brands delivering ≤2mg tar. Complete analytical characterization will be done for all brands including C.I., blend composition, flavor composition, and nontobacco materials. Internal subjective profiling and monadic POL testing of target brand families also will be performed. Data from these studies, together with brand histories, demographics and switching research data, will be used to formulate definitive development tactics.

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| Target brand subjective profiles | February, 1990 |
| Complete target brand data | 1st Qtr., 1990 |
| Complete target brand POL testing | 2nd Qtr., 1990 |

2. Initial Prototype Directions - Exploratory prototypes, encompassing several potential unique marketing concepts, are in progress and will be monadically POL tested against the target brands. These prototypes potentially may include: (a) 1, 2, and 3mg MFUL and MUL system-based models with CA filters; (b) a 2mg ART model; (c) a 2mg "no additive" model (water only) and (d) the best current Project 202 prototype. Based on complete target brand data and prototype subjective performance, one or more of these prototypes and/or additional prototypes will be refined for further monadic POL testing. POL results will be used to guide subsequent product direction(s) and development activities for regular and menthol systems.

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| Exploratory prototype development | February, 1990 |
| Begin prototype monadic POL testing | 2nd Qtr., 1990 |

C. STRATEGY III -- "BEST OF THE LOWEST" -- DEVELOP PRODUCTS WHICH UTILIZE PROPRIETARY PM TECHNOLOGIES, VIZ., TAR REDUCTION, NICOTINE CONTROL, FLAVOR DELIVERY, ETC., WHICH WILL DEMONSTRATE CONSUMER ADVANTAGES VIA R.G.A. TESTING.

1. Ultra-low Tar Product Development - Baseline prototype development will begin with conventional low tar blends (Blend 218, and MUL Blend) incorporating 10% ART ET. Several generations of prototypes (1mg 85mm, 2-2.5mg 100mm) are planned, beginning with more conventional materials and construction and then gradually incorporating new filter, paper, blend, processing, construction and flavor technologies as available through short- and long-term R&D programs. Initial focus will be on processing and ART-inclusion blend development, addressing issues such as blend component extraction, total blend expansion, degree of nicotine extraction and cut filler blending. Target brands will be the

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same as for "Ultima", using target brand analytical and historical data from that program for additional direction. Acceptable proprietary technology prototypes, both regular and menthol, will undergo R.G.A. testing.

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| Baseline prototypes | February, 1990 |
| Proprietary process prototypes | 1st Qtr., 1990 |
| ART-inclusion blends/process studies | 2nd Qtr., 1990 |
| Blend, filter, flavor development | 2nd Qtr., 1990 |
| Optimized prototypes | 3rd Qtr., 1990 |
| R.G.A. testing | 3rd Qtr., 1990 |

2. PM Family Nicotine Segmented Line Extension - The objective will be to develop line extensions for existing PM brand families which deliver half the current smoke nicotine in each tar segment. Development will commence with the B&H family, initially incorporating full extraction ART filler into the B&H blend to achieve 50% nicotine reduction in a full flavor baseline prototype. Process and blend development work will proceed according to the ultralow product timetable above. Controlled nicotine extraction and expansion of the total B&H blend also will be evaluated. Conventional B&H construction will be used with adjustments as necessary. Monadic POL tests of B&H 100s and Lights 100s will be conducted to obtain current brand baseline information. Flavor development activities will be directed toward maintaining the B&H signature in 50% nicotine-reduced prototypes, for both regular and menthol systems.

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| Baseline full flavor prototype (55% ART/45% B&H blend) | February, 1990 |
| Complete blend/process development | 2nd Qtr., 1990 |
| Complete monadic POL testing | 2nd Qtr., 1990 |
| Initial prototype testing | 2nd Qtr., 1990 |

D. STRATEGY IV -- FILTER RESEARCH & DEVELOPMENT:

1. Filter Design & Materials - Continued emphasis is expected on development of new filter components and designs for increased efficiency at constant RTD, selective filtration and gas phase control at reduced ventilation. Among new high efficiency materials which will continue in development and testing are PM web, acetylated paper and CA-coated paper, with the following objectives: (1) subjective improvement over paper/CA filters, (2) increased filtration efficiency, (3) acceptable rod physical properties and (4) production feasability. Work also will continue on concentric filters to optimize physical and subjective performance. Carbon studies will continue to: (1) identify acceptable substitutes for current materials, (2) assess additive and filter loading effects on smoke subjective quality and (3) develop new gas phase analytical criteria and attempt to establish relationships between gas phase composition and cigarette subjective quality.

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2. Filter Additives - Further work is planned to assess potential filter additives for masking/reduction of paper filter off taste. Additive work may continue to reduce nicotine delivery.

E. STRATEGY V -- PAPER TECHNOLOGY:

Support from the paper technology program is expected to continue in two key areas: (1) development of acceptable, high-efficiency filter materials (see D-2) and development of new cigarette papers for burn rate and puff count control. Extensive work is expected on sol-gel technology during 1990.

F. STRATEGY VI -- FLAVOR RESEARCH & DEVELOPMENT:

1. Release Compound Research - Work will continue on development and application of CR and vendor release compound technology for flavor delivery in mainstream smoke. A possible application of this technology, which will be explored, is to increase perceived impact and response in low tar products via specific release compounds applied to paper. Process work with GMC will continue for direct application to filler for charcoal-filtered products.

2. New Flavor Screening - Screening will continue on new vendor flavor submissions as received, seeking flavors which may enhance specific or general subjective smoke characteristics in low tar products.

3. Tobacco Extract Fractionation - Process and application testing in progress will continue to demonstrate subjective utility of Flue-cured and Burley fractions through POL tests on low tar regular and ART-based prototypes. Based on subjective results, a decision will be made regarding pilot or commercial scale-up of the process. Analytical characterization of fractions will continue.

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| POL testing on low tar regular and ART prototypes | 3rd Qtr., 1990 |

4. Flavor Encapsulation -- Work on microencapsulation technology development for menthol will continue both inhouse and externally. Currently, plans are in progress for a visit to Southwest Research Institute to discuss technology development and pilot-scale capsule production. Extensive work is planned: (a) to reduce capsule size for direct application to tobacco and (b) to optimize menthol storage retention and delivery. Based on success of menthol work, further flavor applications of alginate-based microencapsulation technology may be evaluated.

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| Initial SWRI contact | February, 1990 |
| Prototype SWRI menthol capsules | 2nd Qtr., 1990 |

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III. **Resource Allocations**:

| PROJECT GROUP | MAN-YEARS |
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| Domestic Flavor Development (2304) | 1.9 |
| Applied Flavor Investigation (2305) | 0.5 |
| Basic Flavor Investigation (2307) | 1.5 |
| Other | 0.3 |
| TOTAL FLAVOR DEVELOPMENT PROJECTED, 1990 | 4.2 |
| CURRENT, 1990 | 2.0 |
| DIFFERENCE, PROJECTED VS CURRENT | 2.2 |

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